VO'75 DSE

PRELIMINARY

VU-DATA
Model 1201
Power Supply

U-DATA CORPORATION

Module 1201 Power Supply Calibration Procedure

I. General

This procedure provides the necessary information to align and verify the 1201 power supply for proper operation.

The 1201 power supply regulators are contained on two power supply boards (High Voltage 12013004) and (Low Voltage 12013003) which plug into the Master Board 12013002. Before attempting to align the Power Supply assure that both regulator boards are inserted properly and that at least 1 module is inserted into the rack chassis for a load.

II. Test Equipment Required

1. Digital Volt-ohmmeter - Fairchild Model 7050
2. Multimeter

III. Alignment and Verification

1. Before applying power, measure the DC resistance with the Digital-ohmmeter between the points shown below with the low input of the meter connected to 0V. The resistance should be as specified below for each measurement with no modules in the rack chassis.

Points on Master Board		Resistance
+8V	to 0V	
-8V	to 0V	
+120V	to 0V	
-1200V	to 0V	

CAUTION

While performing this procedure it is necessary to measure

voltages which could be fatal or cause bodily harm. Extreme caution should be used when making these measurements. Power should be removed from the unit when attaching the leads from the test equipment.

2. Apply power and measure the voltage between the master board points and 0V with the digital voltmeter. Plug in one module before making adjustments, if required.

Points on Master Board	Control	Reading
+8V and 0V	R6	+8.0 Volts ±2%
-8V and 0V	R13	-8.0 Volts ±2%
+120V and 0V	R22	+120 Volts ±2%
-1200V and 0V	None	-1200 Volts ±5%

3. Using the multimeter measure the voltage between the -1200V and the -1245. This voltage should be 45V ±10%.

U-DATA CORPORATION

Test and Alignment Procedure for 1220A and 1210A Oscilloscope Module

I. Test Equipment Required - Equivalent Equipment may be substituted

1. Function Generator
2. Oscilloscope - Tektronix 530
3. Multimeter
4. Constant Amplitude Generator - Tektronix 190
5. Counter

II. Prealignment

1. Adjusted Preset

   a. Preset all screwdriver adjustable variable resistors to their mid position with the exception of the intensity (R114) and stability control (R79) which should be set in the CW position.

   b. Set the Vertical Switches for a grounded input coupled, 1V, and all verniers to clockwise or Cal Position.

   c. Set Horizontal Switch to 2msec/div (100Hz on 1210 Module) and set the vernier to Cal. (On 1210 Module set VAR Trimpots fully CW)

2. Power Supply

   a. Using the multimeter check the resistance between the following points. Resistance readings should be greater than the value shown:

Points	Resistance
+8V to 0V	
-8V to 0V	
+120V to 0V	

-1200V to 0V

-1200V to -1245V

b. Apply power and measure the DC voltages between the following point

Points	Voltages
+8V	Decoupled to 0V
-8V	Decoupled to 0V
+120V	Decoupled to 0V

III. Alignment

1. Adjust the vertical DC Balance Control, R15, for 0V between pin 7 and pin 3 of integrated circuit, U1.
2. Adjust the vertical position control (R117) to vertically center the trace on the screen.
3. Adjust the trace angle control (R55) to rotate the display square with the graticule.
4. Adjust the horizontal position control (R116) to horizontally center the trace on the screen.
5. Apply a 2 volt PP sine wave at 1KHz to the A (REC) input on the rear of the rack chassis, and switch the input switching to A (REC), 1V, and AC coupled. Reduced input may be required for on screen display.
6. Adjust the stability control (R79) to a point at the middle of the range where the display is stable. (At one end the trace might disappear and at the other end the waveform might free run.)
7. Adjust the intensity control (R114) for the desired brightness.
8. Adjust the focus control (R115) for the sharpest waveform.
9. Adjust the astigmatism control (R100) for the sharpest waveform.
10. It may be necessary to readjust the last three controls to obtain the most desirable waveform. For the remainder of this procedure the Vertical and Horizontal positions may be adjusted as desired.

11. Apply a 5 volt (.5 volt for 1210 Module) PP square wave from the oscilloscope calibrator into the B input at the rear of the rack chassis and set the vertical switching for B (REP), 1V, and AC coupled (B, (REP), Var. gain, and AC coupled for 1210 Module).
12. Adjust the vertical gain control (R31) for a vertical display of 5 divisions (the display should be equal to the 3db lines on the 1210 Module. The front panel vern screwdriver adjust should be CW for this adjustment.
13. Set the calibration output for 2 volts PP. Vertical Switch to B (REP), 1V, AC coupling.
14. On 1210 Module set 1V, REP, Cal (R3) for a signal equal to the 3db line on the graticule.
15. Adjust the Vertical Comp. control (C2) to achieve the best leading edge on the square wave.
16. Apply a 2 volt PP sine wave at 1.00KHz to input A, set the vertical switching for A (REC), AC coupled, and 1V, and adjust the horizontal Cal control (R52) for a display of 10 cycles per 5 major divisions. Be sure vernier is in Cal position. It may be desirable to adjust the vertical and horizontal position to position the peaks of the waveform on the horizontal centerline.
17. Set the output of the sinewave generator to 100.KHz and the Horizontal switch to 20 usec (10KHz on the 1210 Module). Adjust the High Frequency Calib C16 for a display of 10 cycles per 5 major divisions. Be sure vernier is in Cal position.

IV. Specification Validation

1. Control Preset

   a. Set Vert. switching to A (REC), AC coupling, and 1V, and the vern to Cal.

b. Set the Horiz. switch to 2 msec (100Hz on 1210 Module) and the vern to Cal.

2. Vertical Accuracy (1220 Module Only)

a. Connect the calibration output to the A (REC) input.

b. Set the calibration output to the values shown below noting that the display on the screen corresponds to that indicated ±3%

Calibration Output	Vert. Sw.	Display
.2V	.05	4 div
.5V	.1	5 div
1V	.2	5 div
2V	.5	4 div
5V	1	5 div
10V	2	5 div
20V	5	4 div
50V	10	5 div

Turn the vernier fully CCW and note that the display drops to 0 division. Return the vern to the Cal position and switch the AC-DC from AC to DC noting that the position of the waveform shifts vertical position by 1/2 the PP amplitude of the waveform.

*2. Vertical Accuracy (1210 Module Only)

a. Set the calibration output to 2V and connect to A (REC) input. Note that the display is equal to the 3db lines on the graticule ±3%.

b. Set the vert switch to REC-AC-VAR and turn the Rec Front Panel Variable Gain fully clockwise.

c. Set the calibration output to 0.5V and note that the display is 4.3 Div.

d. Turn the Rec Front Panel Variable gain fully counter clockwise and set the calibration output to 20 volts.

e. Note that the display is 4.25 Div.

f. Repeat steps b through e using the (REP) input and the REP positions of the switch.

g. Switch the Vert. switch from REP AC to REP DC and note that the relative position of the display varies by 1/2 the PP amplitude of the waveform.

3. Vertical Bandwidth

a. Connect the Constant Amplitude Generator to the B (REP) input and set the Vertical switching to B (REP), AC coupling, and 1V.

b. Set the output from the generator for 6 Vert Div at 50KHz.

c. Increase the frequency of the generator to 2.5MHz and note the amplitude of the display does not vary by more than 0.6 div.

d. Increase the generator frequency to 5MC and note that the amplitude of the display does not vary more than 3db (-3db lines are marked on the graticule).

4. Time Base Accuracy

a. Connect the sinewave generator set at 2V PP output to the B (REP) input and set the vertical switches to B (REP), 1V, AC.

b. Using the counter set the frequency of the sinewave generator to the frequency shown below for the vertical switch position and note the proper display. (It may be advantageous to vertically position the display so the peaks are on the horizontal centerline).

Switch		Freq.	Display ±3%
1210	1220		
10Hz	20msec	100Hz	2 cycles per major division
100Hz	2msec	1KHz	"
1KHz	.2msec	10KHz	"
10KHz	20usec	100KHz	"
100KHz	2usec	1MHz	"

c. Turn the Horiz. vernier fully clockwise and note that the display is 1 cycle across the complete graticule.

5. Trigger

a. Set the sine wave generator for 1KHz and the Horiz. switch to 2Msec (100Hz on 1210 Module).

b. Decrease the signal amplitude from the signal generator for a display of 0.5 div and note that the unit exhibits a stable display.

c. Increase the frequency of the signal generator to 5 MC white maintaining the amplitude at 0.5 divisions and note that the unit exhibits a stable display (Set the Horiz. switch for a desirable display).

on 12003 d. For units with option 12003 (Trigger Option) complete steps e through i.

e. Set the sine wave generator for 1KHz and 0.5 division the Horiz. switch at 2 Msec (100Hz on 1210 Module).

f. Switch the +/- slope switch and note that the start of the display switch changes the slope and coincides with the switch position.

g. Switch the INT/EXT switch to EXT and jumper the input signal to the Ext. Trigger input at the rack chassis input.

h. Set the generator output to 0.5V and note that the unit exhibits a stable display of the signal.

i. Increase the frequency of the generator to 5MHz and note that the unit exhibits a stable display (Set the Horiz, switch for a desirable display).

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IS NOT TO BE DISCLOSED TO OTHERS, REPRODUCED OR USED WITH-
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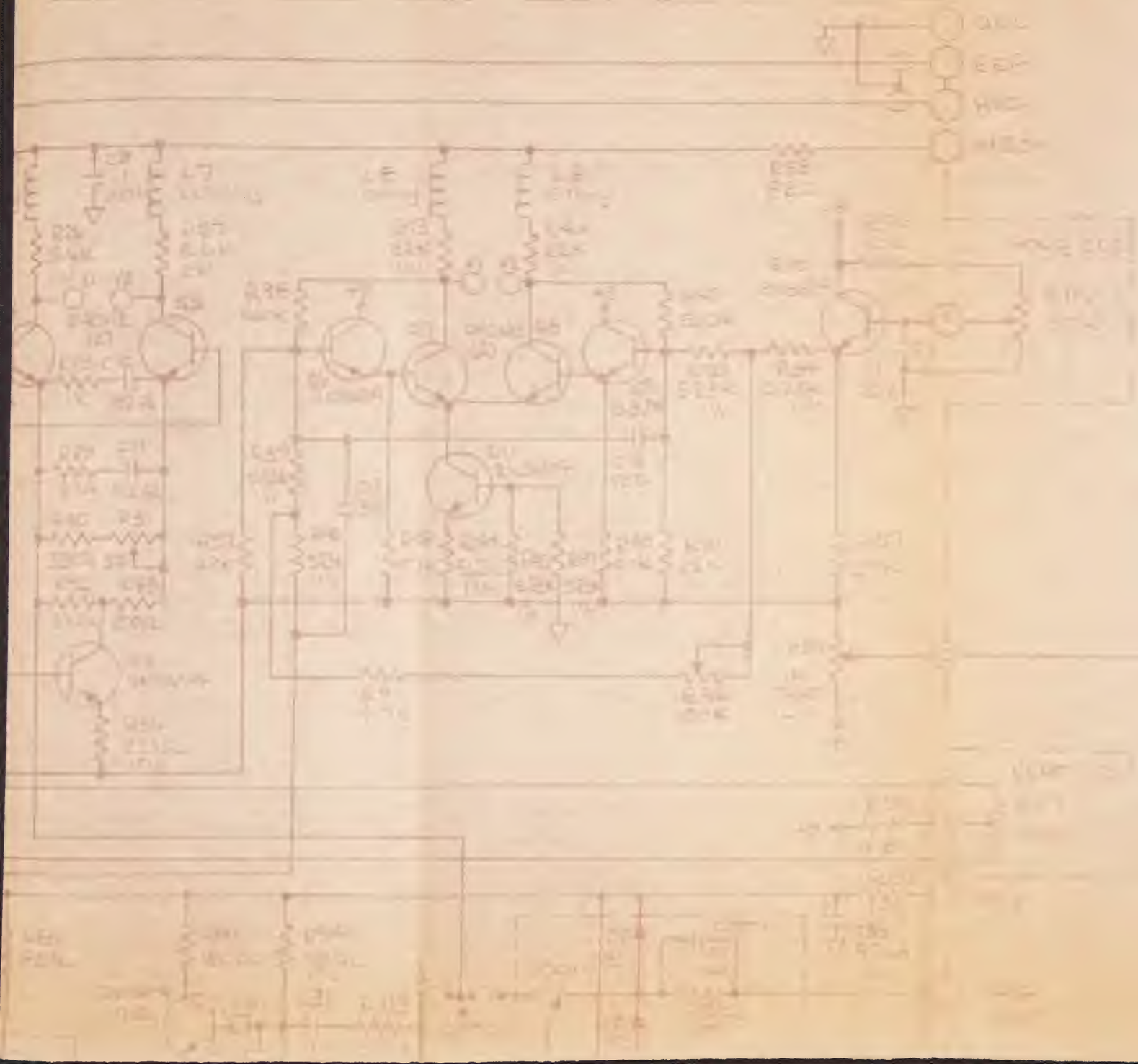
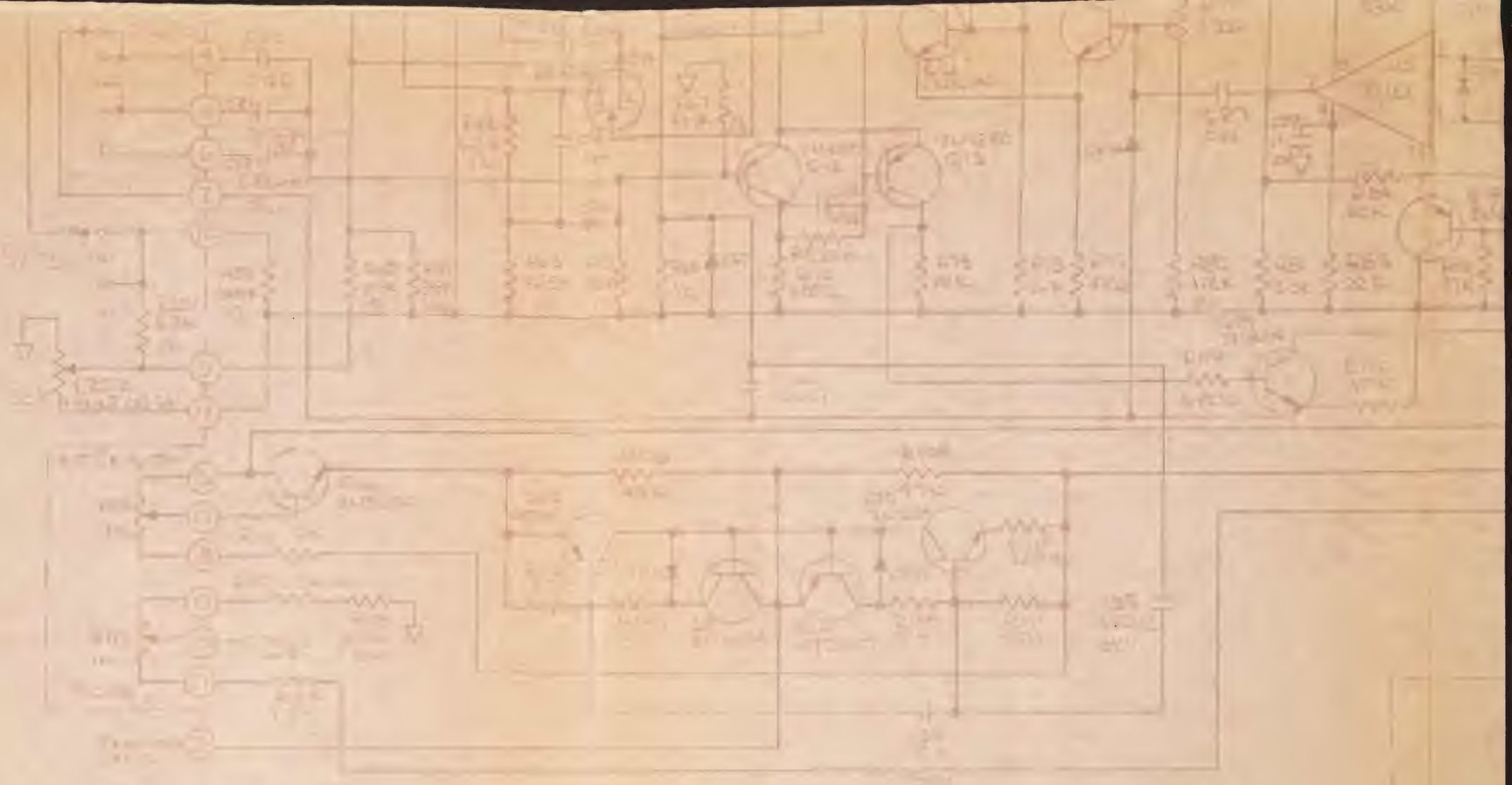
4 3 2 1

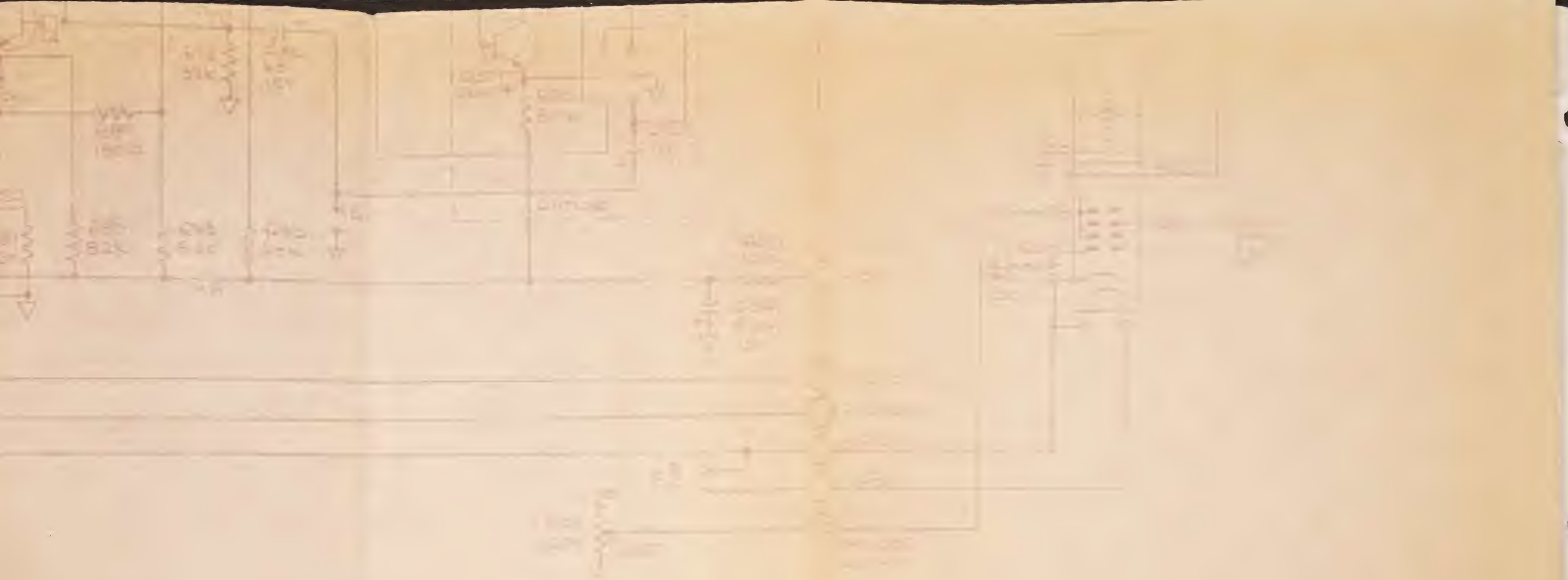
REVISIONS

REV	DESCRIPTION	BY	DATE





8 7 6 5



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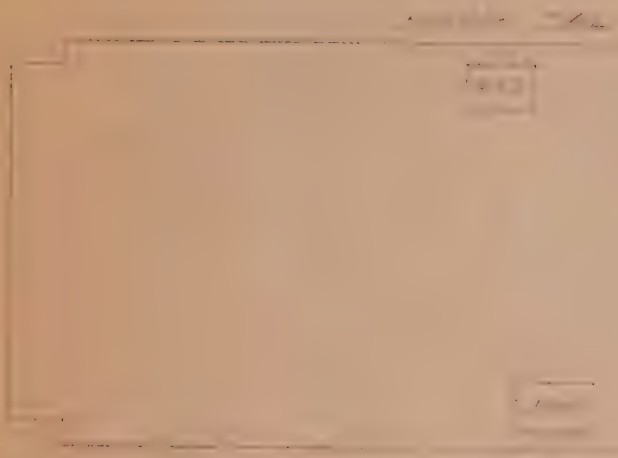


3. C2, C16 ADJUSTED FOR

PART NO.	QTY REQ'D	NEXT ASSEMBLY	USED ON

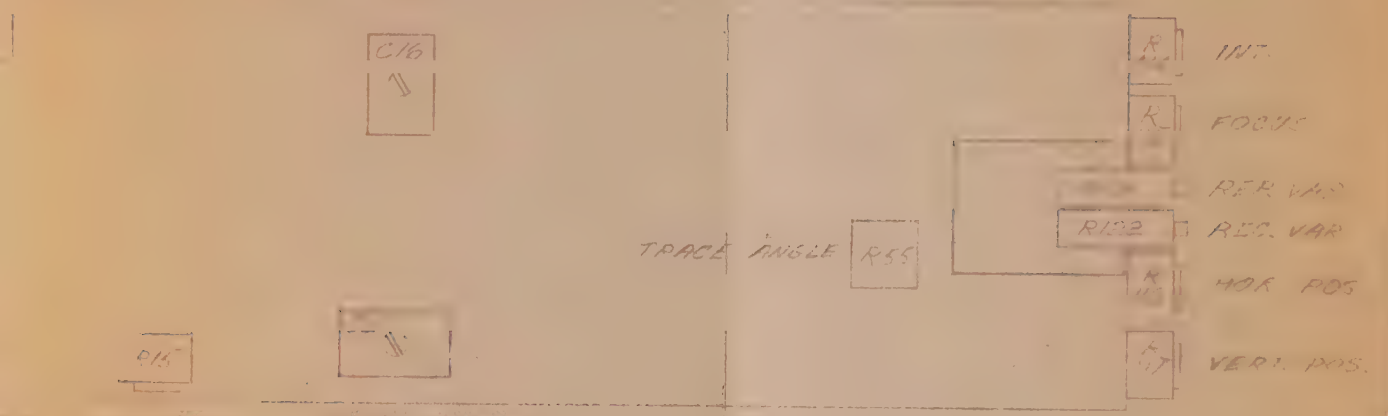
APPLICATION

UNLESS OTHERWISE SPECI
DIMENSIONS ARE IN INCH
TOLERANCES ON
FRACTIONS ± DECIMALS .X ±
ANGLES ± .XX ±
SURFACE FINISH ✓ .XXX ±
MATERIAL

Finish

		DATE

STAE HI FREQ ADJ.



DESCRIPTION	SCHEM DES	VU-DATA PN	MIL OR VENDOR PN	CODE OR

LIST OF MATERIAL

CONTRACT NO

DRAWN

CHECKED

ENGINEER

APPROVED

APPROVED

APPROVED

CUSTOMER APPROVAL

VU-DATA CORPORATION

SAN DIEGO, CALIFORNIA

SIZE	CODE IDENT NO.	DRAWING NO.	REV
B	38180	1201006	

RELEASE DATE

SCALE

SHEET OF 1

U-DATA CORPORATION

SAN DIEGO, CALIFORNIA

SERIES 1200

MONITOR OSCILLOSCOPES

- UP TO SEVEN PLUG-IN DC-5 MHz OSCILLOSCOPES
- 2" DISPLAY HEIGHT
- "IN-LINE" CRT PRESENTATION
- ALL CONTROLS ON FRONT PANEL
- SELECTABLE DUAL INPUTS PER CHANNEL
- INDIVIDUAL ATTENUATOR AND SWEEP RATE CONTROLS

NEW

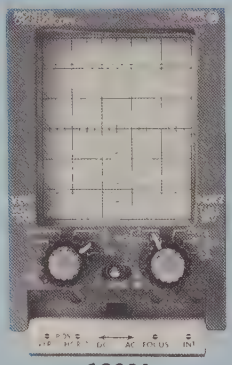
FOR MAGNETIC TAPE RECORDER
AND
REAL-TIME DATA MONITOR

SERIES 1200
MONITOR OSCILLOSCOPES

SAN DIEGO, CALIFORNIA

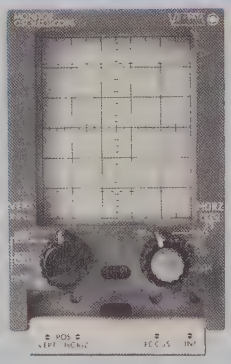
U-DATA CORPORATION

ADDITIONAL FEATURES



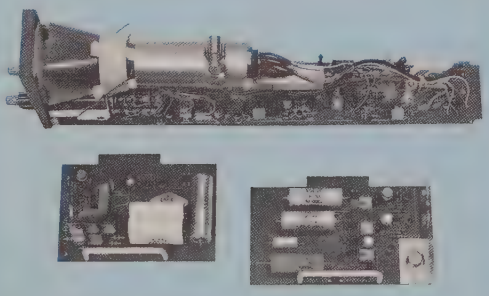
1220A

This solid state oscilloscope module, Model 1220A, includes all the basic controls of a laboratory oscilloscope, which are positioned on the front panel. Either of two inputs (A or B) can be selected for display on the rectangular CRT featuring a 2″ display height, bright intensity and small spot size. Up to seven of these units can be plugged into a single 3½″ high, rack mountable chassis containing a common power supply. An internal latch automatically locks each module firmly in place once inserted. A trap door located beneath the vertical and horizontal range switches, and input signal selector, tilts down to expose position, focus, intensity and AC/DC coupling controls. This door also serves as a handle to extract the module. Astigmatism, and optional internal/external trigger and positive/negative slope selection controls are positioned internally.



1210A

The Model 1210A Oscilloscope Module shown is similar to the Model 1220A described above, except that its attenuator configuration and the calibration of both the vertical and horizontal controls are oriented toward instrumentation magnetic tape recorder applications. Specifically, the attenuator is divided into fixed and variable sections for each of the record (REC) and reproduce (REP) input signals. A single 1 V rms full scale range allows the operator to measure the absolute values of the REC and REP inputs; this calibration can be readjusted internally to any full scale value between 250 mV rms and 10 V rms (or p-p equivalents). The variable attenuator section includes separate 15 turn variable gain controls for both the REC and REP inputs to allow the signals to be independently normalized for full scale deflection over the 40:1 range from 250 mV rms to 10 V rms. Sweep rate is calibrated in frequency full scale.



1200 ASSEMBLIES

All of the active circuitry within Model 1200 Monitor Oscilloscope is contained on but three different plug-in printed circuit assemblies. These include the oscilloscope module, as well as low voltage and high voltage power supply assemblies as shown. They are also available and conveniently packaged as a spare parts kit for use in trouble shooting and maintaining the 1200 in remote field locations over long time periods. The oscilloscope module plugs into the chassis from the front, while both power supply assemblies are inserted by removing a top rear cover. Reference designators for transistors and other components, power supply voltages and circuit polarities are indicated on the printed circuit board. An extender cable assembly is provided to facilitate oscilloscope module calibration and maintenance.

1200 REAR PANEL

Signal input is provided for each of the seven oscilloscopes (channels) on the chassis rear panel as shown. Standard BNC connectors are employed to facilitate system interface, and they are positioned to enable use of "T" connectors in the event "input/output" capability is desired. Both A (REC) and B (REP) inputs as well as an external trigger input (optional) are provided for each channel; all connectors are isolated from case and power line ground to assist in controlling system ground loop problems. Shielded coaxial cable is used to carry input signals to front panel switching to maintain proper isolation between channels.

SERIES 1200
MONITOR OSCILLOSCOPES

APPLICATIONS

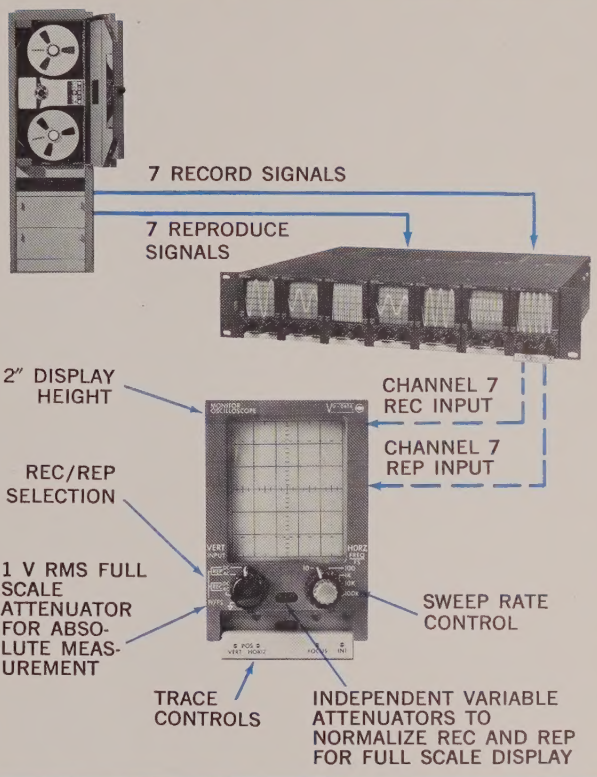
INSTRUMENTATION MAGNETIC TAPE RECORDER/REPRODUCER

The seven channel, "in-line" configuration of the Model 1200A(R) Monitor Oscilloscope with its Model 1210A Oscilloscope Modules makes it ideally suited for instrumentation magnetic tape recorder/reproducer applications where continuous, simultaneous signal monitor is essential to ensure successful data collection. It guards against data loss and the excessive costs necessary to regain it by performing three basic functions:

(1) Facilitates setup of the record/reproduce electronics to enable proper recording.

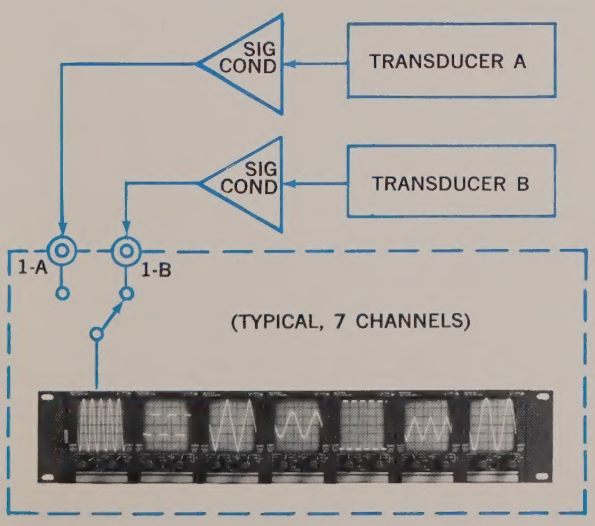
(2) While recording, the 1200A(R) provides simultaneous monitor of all record tracks so the operator can be alerted to the loss of a signal and take immediate corrective action.

(3) The reproduce tracks can be monitored, by switching the 1200A(R) input selectors to REP, for reproduce verification and on-site analysis of all data recorded after test.


7 RECORD SIGNALS
7 REPRODUCE SIGNALS
2" DISPLAY HEIGHT
CHANNEL 7 REC INPUT
CHANNEL 7 REP INPUT
REC/REP SELECTION
1 V RMS FULL SCALE ATTENUATOR FOR ABSOLUTE MEASUREMENT
SWEEP RATE CONTROL
TRACE CONTROLS
INDEPENDENT VARIABLE ATTENUATORS TO NORMALIZE REC AND REP FOR FULL SCALE DISPLAY

REAL-TIME MONITOR

The multi-channel, "in-line" display capability offered by Model 1200A Monitor Oscilloscope makes it ideally suited for real-time monitor applications where simultaneous display of several signals is desirable to guarantee optimum performance or to facilitate analysis. The self-contained vertical and horizontal control circuitry associated with each Model 1220A Oscilloscope Module allows a given signal to be analyzed without disturbing the display of the remaining signals. As the diagram of a typical application shows, a total of seven dual input channels are provided, thus allowing up to fourteen analog or digital signals to be monitored, seven at a time.



Typical phenomena to be monitored include:

- Jet engine and steam turbine vibrations
- CATV and CCTV transmission signals
- Flow-induced vibrations in nuclear reactors
- Shake table transducer outputs
- Wind tunnel stress data
- Telemetry signals
- Propulsion gear and shaft vibrations
- Facsimile signals
- Biomedical and geophysical data
- Data communication signals
- Ship hull vibrations
- Signal amplitude and frequency relationships

SERIES 1200
MONITOR OSCILLOSCOPES

SAN DIEGO, CALIFORNIA

VU-DATA CORPORATION

SPECIFICATIONS — 1200A & 1200A(R)
(EACH OF UP TO 7 OSCILLOSCOPE MODULES)

VERTICAL DEFLECTION

BANDWIDTH: DC to 2.5 MHz within 1 dB; DC to 5 MHz within 3 dB; usable beyond 10 MHz.

COUPLING: AC and DC selectable for either of two inputs, or Ground.

DEFLECTION FACTOR—

1200A: 50 mV p-p/div to 10 V p-p/div in 8 calibrated ranges, 1-2-5 sequence. Vernier: Continuously variable between ranges; extends maximum deflection factor to approximately 25 V p-p/div.

1200A(R): Each of two inputs has a front panel mounted 15 turn variable gain control, adjustable from 250 mV rms full scale to 10 V rms full scale. In addition, a selectable 1 V rms full scale fixed attenuator range is provided for absolute measurements; may be set to any value from 250 mV rms full scale to 10 V rms full scale (or p-p equivalents) by internal calibration adjustment.

ACCURACY: All ranges accurate to within 3% of full scale with vernier (if applicable) in Calibrate position.

INPUT R AND C: 1 megohm within 2% paralleled by less than 100 pF.

ISOLATION: Signal, as well as external trigger, input BNC connectors are isolated and floating from case and power line ground by greater than 10,000 megohms. Strap on master board allows signals to be terminated or floated; normally shipped terminated.

DC STABILITY: Drift less than 2% of full scale upon application of power. No detectable drift after five minutes warm-up.

HORIZONTAL DEFLECTION

TIME BASE—

1200A: 2 μsec/div to 20 msec/div in 5 calibrated decade ranges. Vernier: Continuously variable between ranges (X1 to X10, uncalibrated); extends maximum sweep rate to 200 nsec/div.

1200A(R): 10 Hz full scale to 100 KHz full scale in 5 calibrated decade ranges. Vernier: Continuously variable between ranges (X1 to X10, uncalibrated); extends maximum sweep rate to 1 MHz full scale.

ACCURACY: All ranges accurate to within 3% of full scale with vernier in Calibrate position.

LINEARITY: Within 3% of full scale.

TRIGGER

MODE: Automatic from less than 10Hz to beyond 5 MHz.

SOURCE: Internal trigger provided. External trigger available as standard option (12003) which provides for selection of internal/external trigger by switch mounted internally on oscilloscope module printed circuit board.

SLOPE: Positive. Both positive and negative slope selection for internal as well as external trigger provided by, and as a part of, the external trigger option (12003); selectable by switch mounted internally on oscilloscope module printed circuit board.

AMPLITUDE REQUIREMENTS: 0.5 div vertical deflection for internal trigger, or 500 mV for external trigger.

CRT

CRT: 3-inch diagonal rectangular CRT is employed; mounted with longer dimension in vertical plane, thus providing approximately 2 full inches of vertical display height. P31 phosphor normally supplied.

GRATICULE: Black, with 6 vertical div x 5 horizontal div display area; each div is 1/3 inch. Vertical centerline marked in 5 minor divisions per major division; horizontal centerline marked in 4 minor divisions per major division. −3 dB reference lines included.

GENERAL

CONTROLS AND CONNECTORS—

FRONT PANEL:

Oscilloscope Module: Vertical attenuator with vernier control(s); sweep rate multiplier with vernier control; vertical position; horizontal position; focus; intensity; coupling selector; and input selector.

Chassis: Power on/off switch.

CHASSIS REAR PANEL: Dual input signal, and external trigger (Option 12003), BNC connectors for each oscilloscope module.

INTERNAL: Internal/external trigger selector (Option 12003); positive/negative trigger slope selector (Option 12003); CRT astigmatism adjust (calibration potentiometer).

OPERATING TEMPERATURE: 0°C to +55°C.

HUMIDITY: Will operate in up to 95% relative humidity, non-condensing.

POWER: 115 VAC ±10% or 230 VAC ±10%, selected by master board strapping; 50 to 400 Hz; 70 watts for power supply/rack chassis with full complement of oscilloscope modules. No cooling fan required.

WEIGHT: Approximately 35 lbs (15.9 kg); add 5 lbs (2.3 kg) for shipping.

DIMENSIONS: 3½″ H x 17″ W x 15½″ D (8.89 cm x 43.18 cm x 39.37 cm); mountable in standard 19″ RETMA rack.

ORDERING INFORMATION

PRICES:

MODEL 1200A Standard Monitor Oscilloscope (includes 1 each 1201A with 7 each 1220A)	$2,695.00
MODEL 1200A(R) Recorder Monitor Oscilloscope (includes 1 each 1201A with 7 each 1210A)	$2,695.00
MODEL 1201A Power Supply/Rack Chassis (used in 1200)	$ 775.00
MODEL 1201A/12003 Power Supply/Rack Chassis (includes 12003 External Trigger option, as applicable to Rack Chassis)	$ 815.00
MODEL 1210A Oscilloscope Module (used in 1200A(R))	$ 315.00
MODEL 1210A/12003 Oscilloscope Module (includes 12003 External Trigger option, as applicable to single Oscilloscope Module)	$ 325.00
MODEL 1220A Oscilloscope Module (used in 1200A)	$ 315.00
MODEL 1220A/12003 Oscilloscope Module (includes 12003 External Trigger option, as applicable to single Oscilloscope Module)	$ 325.00
OPTION 12001 Blank Panel (used in 1200)	$ 25.00
OPTION 12002 Extender Cable Assembly (one provided at No Charge with initial 1200 ordered)	$ 50.00
OPTION 12003 External Trigger (provides for selection of ± internal and ± external trigger on each of 7 Oscilloscope Modules in 1200)	$ 100.00
OPTION 12004 Chassis Slides	$ 50.00
SPARE PARTS KIT—1200A & 1200A(R) (includes 1 each 1220A, or 1210A, 1 each P/N 1201-1 and 1 each P/N 1201-2)	$ 690.00
PART NUMBER 1201-1 Low Voltage Power Supply Assembly (used in 1200)	$ 258.00
PART NUMBER 1201-2 High Voltage Power Supply Assembly (used in 1200)	$ 161.00
CANISTER (for storage of spare oscilloscope module)	$ 25.00
TECHNICAL MANUAL (one provided at No Charge with each 1200, two on request)	$ 15.00
SPECIAL PAINT (per color per lot ordered)	$ 50.00

Note: Prices listed are F.O.B. San Diego, California.

DELIVERY: Normal delivery for single unit or small quantities in stock to 30 calendar days after receipt of order.

TERMS: 1/2% 10 days, 1/4% 20 days and net 30 days.

ADDRESS ORDERS TO:

Vu-data Corporation
7595 Convoy Court
San Diego, California 92111
Phone: (714) 279-6572

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